

PATENT SPECIFICATION

794,217



Date of Application and Filing Complete Specification:
December 9, 1955.

No. 35495/55.

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Index at Acceptance:— Classes 20(2), F1C1; 96, B(9 : 14F : 19); and 140, A(2F : 2G : 2K1C : 17)
International Classification:— D21h, E04c.

COMPLETE SPECIFICATION

Improvements in or relating to Honeycomb and Like Fabricated Cellular Material.

SPECIFICATION NO. 794,217

INVENTOR:— FRANK MILES CLARK

By a direction given under Section 17(1) of the Patents Act 1949 this application proceeded in the name of Blackburn and General Aircraft Limited, a British company of Brough, East Yorkshire.

THE PATENT OFFICE,
8th April, 1958

DB 04108/1(6) /3598 150 4/58 R

Such cellular material usually comprises contiguous multisided geometrical figures and such material is usually positioned between surface sheets which close the hollow 20 cells of the material which transmit loads between such surface sheets. In any particular application the strength of the honeycomb must be sufficient to transmit the maximum loads imposed on the surface 25 sheets. Where, however, the maximum load is only applied locally this may mean an overall greater strength, and hence a greater mass and weight of the honeycomb material, than would otherwise be necessary. 30 Now the object of the present invention is to provide a simple yet effective means for locally increasing the strength of honeycomb and like fabricated cellular materials against higher compression or shearing loads. 35 To this end according to the present invention, a cylindrical reinforcing member of a length equal to the thickness of the honeycomb or like cellular material is introduced into one or more cavities in such 40 material to make contact with the walls of the cavity and is adhered to such walls, and preferably also to the sheets. The reinforcing cylinder may be composed of the same material as the honeycomb. 45 It will be appreciated that it is a simple

convenient bonding material such as resin adhesive in the case of resin impregnated paper.

In the accompanying drawing is illustrated 65 part of a sheet of honeycomb *a* in which two cells are reinforced by introduction therein of cylindrical tubes *b* and *c* of like material to that composing the honeycomb, which tubes are of such diameter that their 70 external surfaces contacts the walls of the cells in which they are positioned. Prior to the introduction of a tube into its cell, the tube is coated externally with a suitable adhesive by means of which it is adhered to 75 the walls of the cell with which it makes contact.

The length of each tube equals the thickness of the honeycomb material and the arrangement is preferably such that the ends 80 of the tubes are also adhered to the surface sheets customarily employed with such a honeycomb or cellular material.

WHAT WE CLAIM IS:—

1. A method of locally strengthening 85 honeycomb and like fabricated cellular material which consists in introducing a cylindrical reinforcing member of a length equal to the thickness of the honeycomb material into one or more cells therein to 90

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COMPLETE SPECIFICATION

Improvements in or relating to Honeycomb and Like Fabricated Cellular Material.

We, BLACKBURN & GENERAL AIRCRAFT LIMITED, a British Company of Brough, East Yorkshire, and FRANK MILES CLARK, a British subject of 26 Ferriby Road, Hessle, 5 East Yorkshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following 10 statement:—

This invention relates to Honeycomb and like fabricated cellular material, which is usually made of resin impregnated paper or glass cloth but may also be made of metal 15 such as aluminium.

Such cellular material usually comprises contiguous multisided geometrical figures and such material is usually positioned between surface sheets which close the hollow 20 cells of the material which transmit loads between such surface sheets. In any particular application the strength of the honeycomb must be sufficient to transmit the maximum loads imposed on the surface 25 sheets. Where, however, the maximum load is only applied locally this may mean an overall greater strength, and hence a greater mass and weight of the honeycomb material, than would otherwise be necessary.

Now the object of the present invention 30 is to provide a simple yet effective means for locally increasing the strength of honeycomb and like fabricated cellular materials against higher compression or shearing loads.

To this end according to the present 35 invention, a cylindrical reinforcing member of a length equal to the thickness of the honeycomb or like cellular material is introduced into one or more cavities in such

40 material to make contact with the walls of the cavity and is adhered to such walls, and preferably also to the sheets. The reinforcing cylinder may be composed of the same material as the honeycomb.

45 It will be appreciated that it is a simple

matter to determine where greater strength is required in a panel or sheet of honeycomb or like cellular material and that, by means of the present invention, the strength at such places may easily and effectively be 50 increased at a much less weight penalty than if the mass of the honeycomb material had to be increased to cater for the locally applied higher loads.

The inset cylindrical member is preferably 55 made of like material to the constituent material of the honeycomb, whether it be resin impregnated paper, glass cloth, metal or other known material for the purpose. The adhering of the inset member to the 60 walls of the cavity or cell is effected by any convenient bonding material such as resin adhesive in the case of resin impregnated paper.

In the accompanying drawing is illustrated 65 part of a sheet of honeycomb *a* in which two cells are reinforced by introduction therein of cylindrical tubes *b* and *c* of like material to that composing the honeycomb, which tubes are of such diameter that their 70 external surfaces contacts the walls of the cells in which they are positioned. Prior to the introduction of a tube into its cell, the tube is coated externally with a suitable adhesive by means of which it is adhered to 75 the walls of the cell with which it makes contact.

The length of each tube equals the thickness of the honeycomb material and the arrangement is preferably such that the ends 80 of the tubes are also adhered to the surface sheets customarily employed with such a honeycomb or cellular material.

WHAT WE CLAIM IS:—

1. A method of locally strengthening 85 honeycomb and like fabricated cellular material which consists in introducing a cylindrical reinforcing member of a length equal to the thickness of the honeycomb material into one or more cells therein to 90

contact the walls of such cell and be adhered thereto.

2. A method for locally strengthening honeycomb and like fabricated cellular material as claimed in claim 1, in which the cylindrical inset member is composed of the same material as the honeycomb.

3. Honeycomb and like fabricated cellular material when provided with local strengthening or reinforcement substantially

as hereinbefore described with reference to the accompanying drawing.

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—and—
22, Whitefriargate,
Hull.

Agents for the Applicants.

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1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale.*

